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HAYNES AND BOONE, LLP
901 Main Street
Suite 3100
Dallas, TX 75202

EXAMINER	
YANCHUS III, PAUL B	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/688,546
Filing Date: October 17, 2003
Appellant(s): BREEN ET AL.

Bart A. Fisher
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/14/07 appealing from the Office action mailed 7/18/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Applicant's Admitted Prior Art, paragraph 0005 of Applicant's Specification; and

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art [AAPA], in view of Atkinson, US Patent no. 6,498,460.

Regarding claim 1, AAPA discloses a method of operating an information handling system (IHS) including a processor, the method comprising:

determining if a power adapter or a battery is supplying power to the IHS [paragraph 0005];

monitoring the output current of the power adapter if the power adapter is supplying power to the IHS [paragraph 0005];

monitoring the output current of the battery if the battery is supplying power to the IHS [paragraph 0005];

reducing the frequency at which the processor operates if the power output of the power adapter exceeds a first threshold current level [paragraph 0005]; and

reducing the frequency at which the processor operates if the power output of the battery exceeds a second threshold current level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claims 2 and 3, the first and second threshold values described in the prior art are inherently one of either the same level or different levels. Applicant claims reciting that the first and second threshold values are the same (claim 2) and that the first and second threshold values are different (claim 3) is construed to be an admission that the criticality does not reside in whether the first and second threshold values are the same or different and hence are obvious variations of one another.

Regarding claims 4 and 5, AAPA and Atkinson, as described above, disclose continuously monitoring the output current of the power adapter if the power adapter is supplying power to

the IHS. Atkinson discloses setting the threshold according to an available system power budget [column 5, lines 1-4].

Regarding claims 6 and 7, AAPA and Atkinson, as described above, disclose continuously monitoring the output current of the battery if the battery is supplying power to the IHS. Atkinson discloses setting the threshold according to an available system power budget [column 5, lines 1-4].

Regarding claim 8, AAPA discloses a method of operating an information handling system (IHS) including a processor, the method comprising:

determining if a power adapter or a battery is supplying power to the IHS [paragraph 0005];

monitoring the output current of the power adapter if the power adapter is supplying power to the IHS [paragraph 0005];

monitoring the output current of the battery if the battery is supplying power to the IHS [paragraph 0005]; and

reducing the frequency at which the processor operates if the power output of the power adapter exceeds a predetermined threshold current level or the power output of the battery exceeds the predetermined threshold current level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the

processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claims 9 and 10, AAPA and Atkinson, as described above, disclose continuously monitoring the output current of the battery if the battery is supplying power to the IHS. Atkinson discloses setting the threshold according to an available system power budget [column 5, lines 1-4].

Regarding claim 11, AAPA discloses a method of operating an information handling system (IHS) including a processor, the method comprising:

monitoring the output current of a power adapter which supplies power to the HIS [paragraph 0005]; and

reducing the frequency at which the processor operates by receiving a processor hot signal at the processor if the power output of the power adapter exceeds a first threshold current level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output

current and instantaneously reduces the frequency at which the processor operates [slowing the processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claim 12, AAPA discloses a method of operating an information handling system (IHS) including a processor, the method comprising:

monitoring the output current of a battery which supplies power to the HIS [paragraph 0005]; and

reducing the frequency at which the processor operates if the power output of the battery exceeds a first threshold current level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from

either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claim 13, AAPA discloses an information handling system (IHS) comprising:

a processor [paragraphs 0002 and 0005];

a memory coupled to the processor [paragraph 0002];

an AC adapter and a battery for supplying power to the HIS [paragraph 0005]; and

a power control circuit, coupled to the AC adapter and the battery, for reducing the frequency at which the processor operates if the power output of either the AC adapter or the battery exceeds a predetermined threshold level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given

priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claims 14 and 15, Atkinson discloses setting the threshold according to an available system power budget [column 5, lines 1-4]. Atkinson is silent as to how the power supply power budget is determined. However, receiving identification signals from AC adapters and batteries to determine operating information is well known in the art and it would have been obvious to one of ordinary skill in the art to acquire the AC adapter and battery output rating from identification signals received from the AC adapter and battery.

Regarding claim 16, AAPA discloses that the processor includes a control pin for controlling the frequency at which the processor operates [paragraph 0005].

Regarding claim 17, AAPA discloses an information handling system (IHS) comprising:

a processor [paragraphs 0002 and 0005];

a memory coupled to the processor [paragraph 0002];

an AC adapter for supplying power to the HIS [paragraph 0005]; and

a power control circuit, coupled to the AC adapter, for reducing the frequency at which the processor operates by receiving a processor hot signal at the processor if the power output of the AC adapter exceeds a predetermined threshold level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the

processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claim 18, Atkinson discloses setting the threshold according to an available system power budget [column 5, lines 1-4]. Atkinson is silent as to how the power supply power budget is determined. However, receiving identification signals from AC adapters to determine operating information is well known in the art and it would have been obvious to one of ordinary skill in the art to acquire the AC adapter output rating from identification signals received from the AC adapter.

Regarding claim 19, AAPA discloses that the processor includes a control pin for controlling the frequency at which the processor operates [paragraph 0005].

Regarding claim 20, AAPA discloses an information handling system (IHS) comprising:

a processor [paragraphs 0002 and 0005];

a memory coupled to the processor [paragraph 0002];

a battery for supplying power to the HIS [paragraph 0005]; and

a power control circuit, coupled to the battery, for reducing the frequency at which the processor operates if the power output of the battery exceeds a predetermined threshold level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

Regarding claim 21, Atkinson discloses setting the threshold according to an available system power budget [column 5, lines 1-4]. Atkinson is silent as to how the power supply power budget is determined. However, receiving identification signals from batteries to determine operating information is well known in the art and it would have been obvious to one of ordinary skill in the art to acquire the battery output rating from identification signals received from the battery.

Regarding claim 22, AAPA discloses that the processor includes a control pin for controlling the frequency at which the processor operates [paragraph 0005].

Regarding claim 23, AAPA discloses a method of operating an information handling system (IHS) including a processor, the method comprising:

determining if a power adapter or a battery is supplying power to the IHS [paragraph 0005];

monitoring the output current of the power adapter if the power adapter is supplying power to the IHS [paragraph 0005];

monitoring the output current of the battery if the battery is supplying power to the IHS [paragraph 0005];

reducing the frequency at which the processor operates if the power output of the power adapter exceeds a first threshold current level [paragraph 0005]; and

reducing the frequency at which the processor operates if the power output of the battery exceeds a second threshold current level [paragraph 0005].

AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery and instantaneously reducing the frequency at which the processor operates if the power output exceeds a threshold current level. Atkinson discloses monitoring, in real time by hardware components [Current Sense in Figure 1], output current and instantaneously reduces the frequency at which the processor operates [slowing the processor clock frequency] if the output current exceeds a threshold current level [column 5, lines 1-15]. It would have been obvious to one of ordinary skill in the art to modify the AAPA method to continuously monitor the output current, in real time by hardware components, from either the power adapter or battery in order to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [Atkinson, column 2, lines 16-38].

(10) Response to Argument

A. Applicant argues in substance, with regards to claims 1-23, that the combination of Applicant's Admitted Prior Art [AAPA] and Atkinson do not teach or suggest all of the elements of the pending claims. Specifically, Applicant argues that neither AAPA nor Atkinson teach or suggest the limitation, "continuously monitoring, in real time by hardware components, the output current of the battery." Applicant further argues that neither AAPA nor Atkinson teach or suggest the limitation because the Examiner conceded that AAPA does not disclose monitoring output current of a battery and also conceded that Atkinson does not disclose monitoring the output current of a battery. Examiner disagrees.

The examiner relies on AAPA to disclose monitoring output current of a battery [see paragraph 0005, "observing adapter current and battery current"]. AAPA does not disclose that the current monitoring is done "continuously" and "in real time by hardware components." AAPA instead discloses that the monitoring is done using software. Atkinson is relied upon to cure this deficiency. Atkinson discloses continuously monitoring a current in real time using hardware components [see Current Sense in Figure 1 and column 3, lines 57-67]. The motivation for modifying the AAPA teachings to monitor the output current of the battery in the manner disclosed by Atkinson (continuously and in real time by hardware components) is to ensure that the system remains stable in the event of a worst case loading of the system or to ensure that certain important functions are given priority over other non-important functions when power is limited [see Atkinson, column 2, lines 16-38].

Applicant seems to have misinterpreted a statement by the Examiner on page 3 of the office action mailed 2/22/07, "AAPA does not disclose continuously monitoring, in real time by hardware components, the output current of the power adapter or battery." Applicant believes that the statement is a concession that AAPA does not disclose monitoring the output current of the battery. Examiner disagrees. The Examiner clearly states on page 2 of the same office action (in the same claim rejection) that AAPA discloses monitoring the output current of the battery in paragraph 0005 of Applicant's specification. The only concession made by the Examiner is that the AAPA does not disclose the complete limitation "continuously monitoring, in real time by hardware components, the output current of the power adapter or battery." As described above, the deficiencies in the AAPA (monitoring current continuously and in real time by hardware components) are disclosed by Atkinson.

In summary, the combination of AAPA and Atkinson together teach or suggest all of the elements of the pending claims.

B. Applicant argues in substance, with regards to claims 1-23, that the combination of AAPA and Atkinson teach away from the pending claims. Specifically, Applicant argues that the AAPA in paragraph 0005 teaches away from the language of the claim. Examiner disagrees.

In paragraph 0005, the AAPA discloses that the output current of the battery is monitored non-continuously using software. AAPA further explains that this is a deficiency because rapid changes and pulse may not be detected, which could lead to data loss. Nowhere in the specification does the APAA teach or suggest that the claimed method of monitoring current (continuously and in real time by hardware components) cannot be accomplished or is not

preferred over the prior art method of monitoring current. It merely discloses a prior art battery output current monitoring method and the deficiencies associated with that method.

In summary, the combination of AAPA and Atkinson does not teach away from the pending claims.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Paul Yanchus III

Conferees:

/Rehana Perveen/

Supervisory Patent Examiner, Art Unit 2116

/Eddie Lee/

Supervisory Patent Examiner, TC 2100